

ORDER

6600. 28

SMALL TOWER VOICE SWITCH PROJECT IMPLEMENTATION PLAN



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**DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION**

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Initiated By: ANC-200

FOREWORD

This order transmits the project implementation plan (PIP) for the small tower voice switch (STVS) project. The PIP provides technical guidance on the coordination of efforts by a variety of FAA offices and outside organizations for the orderly implementation of STVS into the National Airspace System (NAS). It will be updated as changes are needed, or as useful implementation-related information becomes available. This order has been prepared in accordance with FAA-STD-036, Preparation of Project Implementation Plans and Order 1320.1, FAA Directives System.



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CHAPTER 1. GENERAL

1. PURPOSE. This order provides management and technical guidance for the implementation of the small tower voice switch (STVS), and is to be used for all STVS technical and resource planning activities.

2. DISTRIBUTION. This order is distributed to branch level in the office of the Program Director for Communications and Aircraft Acquisition, NAS Systems Engineering, Acquisition Support, Air Traffic Plans and Requirements, and Systems Maintenance Services; to the branch level at the FAA Technical Center; and regional Airway Facilities, Air Traffic, and Logistics divisions.

3. DEFINITIONS. Definitions for terms and abbreviations used in this order are contained in appendix 1.

4. AUTHORITY TO CHANGE THIS ORDER. Authority to change this order rests with the Program Manager for Voice Switching and Recording, ANC-200.

5.—19. RESERVED.

CHAPTER 2. PROJECT OVERVIEW

20. SYNOPSIS. The STVS is an integrated voice switching system to be installed in FAA-operated airport traffic control towers (ATCT), handling primarily visual flight rules (VFR) traffic, and having four or fewer operating Air Traffic Control (ATC) positions. The STVS will provide access to both air-to-ground (A/G) and ground-to-ground (G/G) communications resources to support ATCT operations (local control, ground control, flight data, etc.).

21. PURPOSE. The STVS project is to provide hardware, installation, logistics and maintenance support, and related services to implement the STVS.

22. HISTORY. The need for the STVS was identified by a study (the Terminal Voice Switch Position Paper)

undertaken by the Systems Engineering and Configuration Management Division (ASE-200) in 1990. This paper identified the need to replace tower voice switch systems that were becoming difficult to maintain due to their age, and that were continuing to require monthly lease payments. The paper recommended that a new national procurement be initiated to supply voice switches to small VFR towers (four positions or fewer), which were found to have, as a class, functional requirements sufficiently different from those of larger facilities (served by the ICSS Phase 1B procurement) to make a separate procurement cost-effective. In response to this recommendation, ANC-200 established the STVS project in 1991.

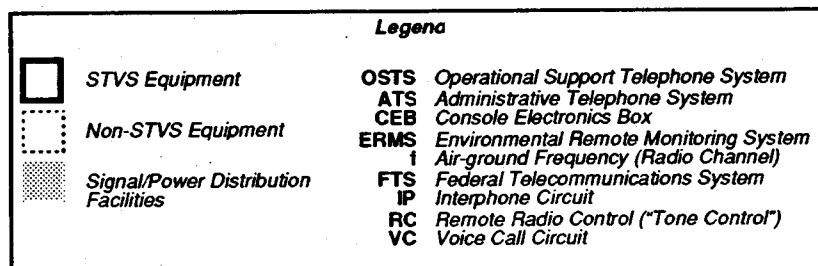
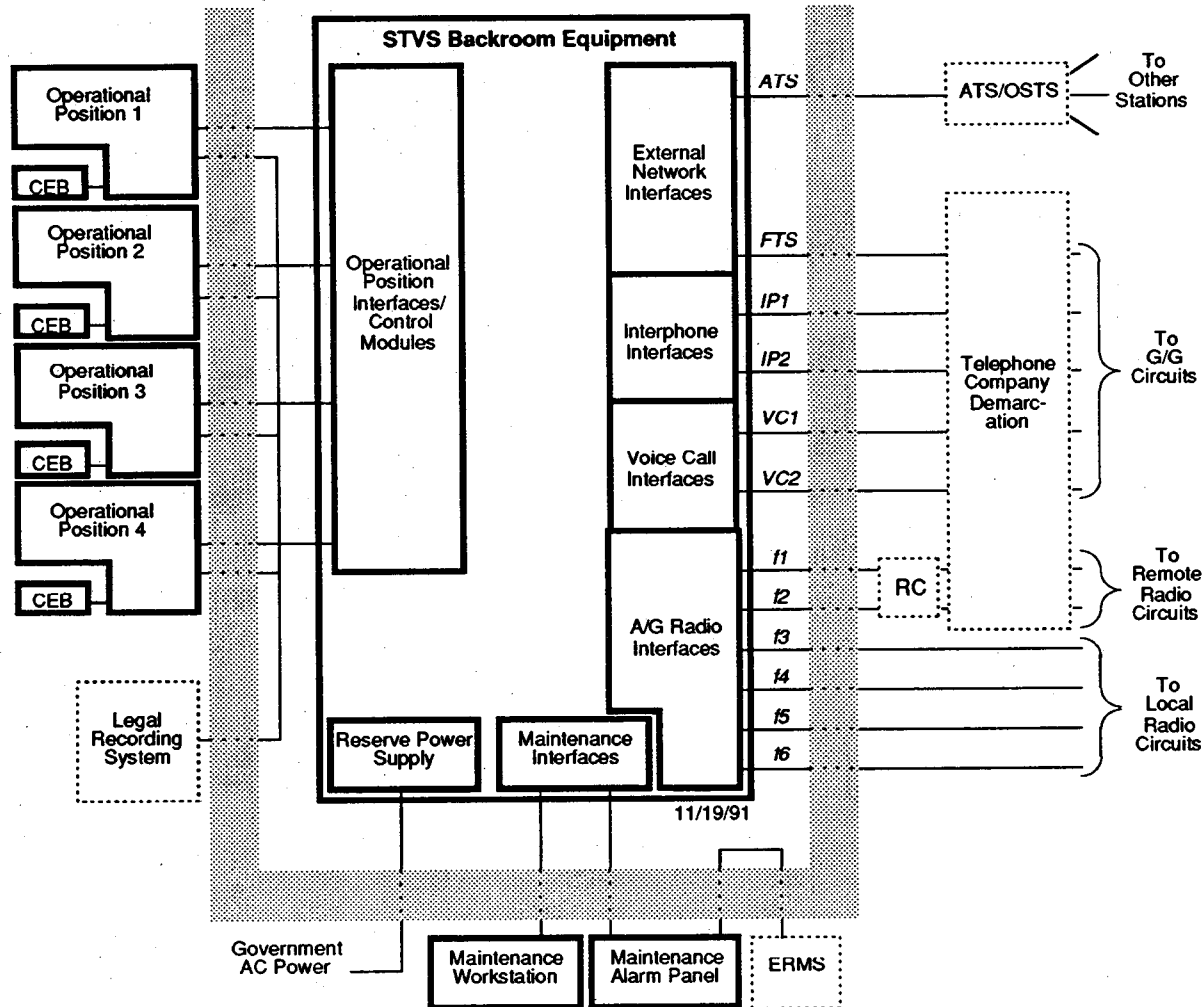
23.-29. RESERVED.

CHAPTER 3. PROJECT DESCRIPTION

30. FUNCTIONAL DESCRIPTION. The STVS is a four-position voice switch that provides operators with access to external communications lines and equipment

for the purposes of operational ATC communications. A functional block diagram of the STVS is shown in figure 3-1.

**FIGURE 3-1. STVS FUNCTIONAL BLOCK DIAGRAM
(TYPICAL CONFIGURATION SHOWN)**



31. PHYSICAL DESCRIPTION. Exact physical characteristics of the STVS are unknown at this time because no contract for this equipment has yet been awarded. However, it is expected that the STVS will consist of the following components:

- a. Central or "backroom" equipment** consisting of power supplies, interconnection frames, interface cards, central processors, and other related equipment depending on the manufacturer's design.
- b. Maintenance workstation** also located in the backroom, which consists of equipment needed to diagnose and test the system.
- c. Console electronics box** containing power supplies, display generators, distributed processing units, and other related equipment depending on the manufacturer's design.
- d. Console equipment** consisting of controls (pushbuttons, adjusters, etc.) and displays used by the operator.

32. SYSTEM REQUIREMENTS. The exact requirements that the STVS will impose on facilities are unknown at this time because no contract for this equipment has yet been awarded. The STVS will, however, be required to meet the following requirements excerpted from the Small Tower Voice Switch Specification (FAA-E-2874).

a. Space. Floor space limits imposed by FAA-E-2874 are as follows:

(1) Central equipment, including maintenance workstation, occupying a floor space footprint of no more than 6 by 4 feet (including aisle space and space for equipment access).

(2) Console electronics box, installed within the console (e.g., on the floor) and occupying a space no more than 12 inches high, 12 inches wide, and 15 inches deep.

(3) Console equipment, installed on the console, occupying a space no more than 19 inches wide, 14 inches high, and 9.5 inches deep.

b. Cooling. FAA-E-2874 imposes a maximum systemwide dissipated power (taking the form mainly of heat) of 600 Watts (W) per position (a total of 2400 W). FAA-E-2874 does not require any specific method

of cooling, but all of the systems likely to be bid for STVS employ either free or forced convection (using internal cabinet fans and built-in filters). Provided that the facility heating, ventilation, and air conditioning (HVAC) system can support the additional heat load, no special facility support for cooling will be required. An overheat alarm will be provided for each STVS equipment cabinet.

c. Power. This subparagraph describes the power requirements of the STVS.

(1) Main alternating current (AC) power supply characteristics. The STVS is required to operate on AC power with the following characteristics:

- Voltage:** 120 VAC \pm 15 percent, single phase
- Frequency:** 60 Hz \pm 6 percent
- Power:** No more than 600W per position (2400W total)

(2) Backup power. The STVS will incorporate its own reserve power supply, which will provide sufficient power for up to 20 minutes of operation in the absence of main power. Alarms and indicators will be provided to indicate the status of the reserve power system. These will be located in the equipment room or remoteds as ordered. The backup power system is required not to vent poisonous or corrosive gases.

(3) Power conditioning. Provided that the main AC power supply for the facility is compliant with the voltage and frequency characteristics given in subparagraph c(1), no special facility power conditioning will be required. The STVS is required to meet the standards of paragraph 3.3.2 of FAA-G-2100 for connection to critical power facilities.

(4) Transient power interruption. The STVS is required to suffer no degradation in performance during transient AC power interruptions of up to 150 milliseconds in duration. The STVS reserve power supply is required to come online without service interruption. Therefore, the STVS should require no special uninterruptible power support from the facility.

d. Environment. This paragraph lists the environmental conditions required by STVS. In general, the STVS operating conditions are consistent with those specified for staffed facilities, so that no special environmental treatment should be required.

(1) Operating environment. The STVS is required to provide full performance without degradation under the following environmental conditions:

- Temperature:** Between 10 and 50 °C; up to ± 8.3 °C change per hour
- Relative humidity:** Between 10 percent and 80 percent non-condensing
- Altitude:** Up to 10,000 feet above mean sea level (MSL)

(2) Non-operating (idle) environment. The STVS is required to sustain no damage when stored, transported, or left idle without power under the following conditions:

- Temperature:** Between -50 and +70 °C
- Relative humidity:** 0 to 100 percent including condensation
- Altitude:** Up to 50,000 feet MSL

(3) Solar radiation. The STVS is required to sustain no performance or appearance degradations when exposed to levels of solar radiation comparable to those of the tower cab environment. STVS displays are rated to be fully visible in conditions of up to 12,000 foot-candles of incident light.

(4) Electrostatic discharge. The STVS is required to pass an industry standard test for susceptibility to electrostatic discharge (see paragraph 3.4.3 of FAA-E-2874). The test will certify that the STVS can withstand routine electrostatic discharge encountered in the tower environment. Facilities should require only normal precautions against electrostatic charge buildup (e.g., proper carpet maintenance or replacement, using floor pads or anti-static sprays, etc.).

33. INTERFACES. Interfaces to the STVS are described in FAA-E-2874. These interfaces include:

a. G/G circuit interfaces. The STVS will interface to G/G circuits according to the transmission plan provided in FAA-E-2874. These interfaces are options to be selected at FAA site survey. The variety of G/G circuit interfaces can be divided into three broad classes as follows:

(1) Interphone circuit interfaces (to other ATC facilities via dedicated voice-grade telephone lines).

(2) Voice call circuit interfaces (to other ATC facilities via dedicated voice-grade telephone lines) employing custom signaling arrangements.

(3) External network trunk interfaces (to administrative telephone systems [including private branch exchanges, key telephone systems, etc.] or to local exchange carrier central offices).

b. A/G radio interfaces. The STVS will interface to A/G communications installations (both local radio equipment and remotely operated radio equipment in a variety of configurations) using contact closure control and voice-frequency interfaces as described in appendix B of FAA-E-2874. The STVS A/G control interface is intended to suit all tower communications installations, including equipment for remote radio control, without need for special parts. This interface is an option to be selected at FAA site survey.

c. Operational support telephone system (OSTS). The STVS will connect to the facility's OSTS (hybrid key system or private branch exchange) to place and answer intra-facility and outside calls. For purposes of connecting to OSTS, the STVS will emulate a single-line, two-wire, off-premises extension (OPX). In the STVS specification, OSTS is referred to as the administrative telephone system (ATS). This interface is an option to be selected at FAA site survey, although the acquisition of the ATS itself is not included in the STVS procurement.

d. Legal voice recorder. The STVS will provide interfaces to connect all incoming and outgoing communications to the facility legal voice recorder.

(1) Position recording—incoming audio. The STVS will furnish each position's incoming audio to the legal recorder; the level of this audio will correspond to the setting of the headset and loudspeaker volume controls at the position (this is so that the legal recording will more accurately represent what the operator heard on the channel).

(2) Position recording—outgoing audio. The STVS will furnish each position's outgoing audio to the legal recorder, but only while the position push-to-talk device is active, while a relief briefing is in progress, or while a G/G call is in progress (this is so that only operational communications will be captured by the legal recorder).

(3) Trunk/frequency recording. The STVS will furnish connections for incoming and outgoing

communications on each trunk to be routed to the legal recorder. These connections will not be subject to the restrictions in subparagraphs d(1) and (2).

e. Supervisory recording. The STVS will provide facilities for ATC supervisors to make informal, ad-hoc recordings of position activity for completing "tape talk" evaluations of controllers. The recordings will be made by connecting standard cassette recorders to interfaces in the equipment room. The initial supply of recorders will be provided by ANC-200. Later replacement can be made outside the STVS contract through a variety of purchasing channels. The STVS will provide a voice-activation feature that can be connected to the "remote" jack of these recorders.

f. Public switched telephone network (PSTN) or federal telecommunications system (FTS) connection. The STVS can be connected to PSTN (for direct dial calls on local telephone company exchanges) or to FTS in the "virtual on-net" configuration.

g. Operator groups. Operator groups comprise the equipment used by controllers to operate and communicate on STVS. Typically, depending upon personal preference or job requirements, an operator would use either headset, handset, or hand microphone (in conjunction with the position loudspeaker). Push-to-talk (PTT) operation is provided by switches incorporated into the headsets, handsets, and hand microphones, or by PTT foot switches that permit "hands-free" radio operation. Initial headset, handset, and hand microphone requirements will be identified during site survey up to the maximum limits of each as defined in subparagraphs g(1) through g(4).

(1) Headsets. Type 2 over-the-ear headsets per FAA-E-2603, Noise Cancelling Headset and Handset are specified for use with the STVS. Plantronics units HSO 0311-10 or HSO 0311-25, or their equivalents, will meet these requirements. The STVS vendor will deliver an initial supply of headsets as defined by the site survey; thereafter, it is intended that these headsets be obtained through the FAA Logistics Center. Initial supplies should consist of not more than one headset for each active controller working at the facility plus an additional allowance for spares. Spares will be required to permit operations to continue while a defective headset is being replaced through the FAA Logistics Center.

(2) Handsets. "G" style handsets per FAA-E-2603, Walker Equipment Corporation PTS-500TC or

equivalent are specified for use with the STVS. The STVS vendor will deliver an initial supply as defined by the site survey; thereafter, it is intended that these handsets be obtained from the FAA Logistics Center. Initial supplies should consist of not more than four handsets per facility plus an additional allowance for spares. Spares are required to permit operations to continue while a defective handset is being replaced through the FAA Logistics Center.

(3) Hand microphones. Hand-held microphones per FAA-E-2162, Microphone, Hand-Held, as tailored in FAA-E-2874, are specified for use with the STVS. These microphones must be configured so that the PTT device does not interrupt the microphone's audio output (allowing "hot mike" operation for G/G communications and relief briefings). They will also use a locking connector (to be selected by the vendor) that allows electrical sensing of jack-in/jack-out status. These modifications will likely make the microphones nonstandard items. A detailed description of the hand microphone will be available after the system review. The STVS vendor will deliver an initial supply as defined by the site survey; thereafter, it is intended that these microphones be obtained from the FAA Logistics Center. Initial supplies should consist of not more than four microphones per facility plus an additional allowance for spares. Spares will be required to permit operations to continue while a defective headset is being replaced through the FAA Logistics Center.

(4) Foot switches. Linemaster 635-S foot-switch PTT devices, or their equivalents, are specified for use with the STVS. These will be nonstandard items since they do not fully conform to the FAA foot-switch specification. A detailed description of the STVS foot switch will be available after the system review. The STVS vendor will deliver an initial supply of foot switches as ordered for each facility; thereafter, it is intended that these foot switches be obtained from the FAA Logistics Center.

h. Door unlock. The STVS will provide a relay closure to activate a door locking solenoid; this relay closure is capable of handling 120 V AC at 1A, or 30 V dc at 2A. The solenoid and power supply are to be provided by the facility.

i. Environmental Remote Monitoring System (ERMS). The STVS will interface to the ERMS using contact closure devices on the maintenance alarm panel. These relay closures are rated to handle 1A at 120 V AC or 2A at 60 V dc. The

STVS maintenance alarm panel will provide separate relay circuits for each of the following conditions:

(1) Main power status. Contact closed means main power online; contact open means main power offline.

(2) Reserve power status. Contact open means reserve power online; contact closed means reserve power offline.

(3) Low reserve power warning. Contact closed means more than 5 minutes of reserve power

remaining; contact open means 5 minutes or less remaining.

(4) System fault detection. Contact closed means fault detected; contact open means no fault detected.

(5) Cabinet overheat. Contact closed means overheated cabinet; contact open means normal temperature.

j. Main AC power. Characteristics of main AC power to be supplied to the STVS are described in paragraph 32c.

34.—39. RESERVED.

CHAPTER 4. PROJECT SCHEDULE AND STATUS

40. PROJECT SCHEDULE AND GENERAL STATUS. A generic schedule for STVS implementation at a single site is shown in appendix 2. Detailed site-specific project schedule information may be obtained from ANC-200.

41. MILESTONE SCHEDULE SUMMARY. An STVS milestone schedule is provided in Appendix 4. Significant events are shown in dates after contract award. Because the milestone schedule is in constant flux, actual dates of events will be provided following contract award. Detailed milestone schedule information may be obtained from ANC-200.

42. INTERDEPENDENCIES AND SEQUENCE. STVS implementation is not dependent on the completion of any other projects, although prior or concurrent OSTs (ATS) installation may be required in cases where the existing ATS key system is incompatible with the two wire STVS interface, or where the existing ATS is being removed along with the leased equipment. In such cases, the region should designate their needs for concurrent ATS installation during early site survey tasks.

43.—49. RESERVED.

CHAPTER 5. PROJECT MANAGEMENT

50. PROJECT MANAGEMENT, GENERAL. The STVS project is part of the terminal voice switch replacement program, which is managed by ANC-200 with the support of numerous organizations. Appendix 3 provides a complete listing of project management contacts.

51. PROJECT CONTACTS. Refer to appendix 3 for a list of STVS project contacts.

52. PROJECT COORDINATION. See table 5-1 for an identification of organizations and their roles in coordinating key STVS project decisions.

53. PROJECT RESPONSIBILITY MATRIX. Table 5-2 lists the organizations responsible for carrying out selected functions described in this order.

54. PROJECT MANAGERIAL COMMUNICATIONS.

a. Meetings and conferences.

(1) Voice Switching Regional Meetings.

ANC-200 sponsors voice switching regional meetings approximately twice per year in various locations to meet with regional representatives, collect and disseminate information, and solve voice switch implementation problems. These meetings are announced in advance by memorandum.

(2) National Airspace Integrated Logistics Support Management Team (NAILSMT). The National Airspace Integrated Logistics Support Implementation Branch (ANS-420) will schedule NAILSMT meetings on a semiannual basis. The purpose of the NAILSMT is to discuss and resolve maintenance, training, and other logistics issues. NAILSMT meetings will be held at the vendor's facility or at Government facilities.

(3) System review. The STVS is a non-developmental project, for which the various design reviews normally conducted on a developmental project are not required. Instead, the project office will conduct a system review with the vendor, in which the vendor will present a production system configuration to be approved by the Government. The vendor will deliver a system requirements allocation document (SRAD) at this review, which will assist in the analysis of the vendor's design allocations.

Table 5-1: STVS PROJECT COORDINATION ROLES
(See appendix 1 for explanation of routing symbols)

Coordination Role	Office
AF Requirements	ASM-100/200/600
AT Requirements	ATR-100
Contracting Officer	DECCO
DRR	AAF-11
Engineering	ANC-100
Logistics/NAIS	ANS-420
Logistics Support	AAC-400
Maintenance Requirements Docmt.	ASM-200
Maintenance Management Plan	ASM-200
NAS Requirements	ASE-200
Project Management	ANC-200
Quality, QRO	ASU-424A
Test Planning	ACN-100
Test Conduct	ACN-100
Test, OT&E/integration	ACN-100
Test, OT&E/shakedown	ASM-600
Tower Integration	ANS-240
Training Requirements, AF	AHT-400
	ASM-250
Training Requirements, AT	AHT-500

(4) Training conference. Approximately 30 days after STVS contract award, the contracting officer will schedule a training conference at the STVS vendor's facility, in coordination with ANS-420 and with assistance from the Technical Training and Certification Branch (ASM-250), the Training Requirements Program (ATZ-100), the Airway Facilities Training Program Division (AHT-400), and the Air Traffic Training Program Division (AHT-500). The purpose of the training conference is to guide the STVS vendor in the development of the STVS training program.

(5) Provisioning conference. Upon completion of the STVS functional and physical configuration audits (FCA and PCA), and appropriate notification from the FAA Logistics Center (AAC-400), the contracting officer, in coordination with ANS-420, will schedule a provisioning conference. The conference will take place at the STVS vendor's facility. The purpose of the conference is for the FAA to validate the master parts list and to determine the

TABLE 5-2. STVS PROJECT IMPLEMENTATION RESPONSIBILITY MATRIX
(See appendix 1 for explanation of routing symbols)

Legend		AAC-485	AAF-11	ACN-100	AHT-400 & -500	ANC-200	ANS-240	ANS-420	ASE-600	ASM-200	ASM-600	ATZ-100	QRO (ASU-424A)	Site TOR	Site/Reg. Personnel	TO	STVS Vendor
<div>■ Primary Responsibility</div> <div>✕ Secondary Responsibility (e.g., Review/Coordination)</div>																	
54. Proj. Managerial Communications	✕			✕	✕	✕			✕		✕						
55. Implementation Staffing						✕											
56. Plans and Reports					✕	✕	✕		✕					✕			
70. General Deployment Aspects					✕												
71. Site Preparation and Site Survey																	✕
72. Delivery														✕			
73. Installation					✕									✕			
81. Factory Verification			✕	✕					✕		✕						
82. Site Verification			✕	✕													
83. NAS Integration Testing					✕												✕
84. Shakedown Testing																	
85. Joint Acceptance Inspection																	✕
90. Maintenance Concept																	
91. Training																	
92. Support Tools & Test Equipment						✕			✕								
93. Supply Support																	
94. Vendor Data & Technical Manuals																	
95. Equipment Removal					✕												
100. Bypass Communications Jacks																	

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type, levels, and quantities of spare parts necessary to support the STVS.

(6) Project reviews. Each quarter after contract award, ANC-200 will conduct comprehensive project reviews with the STVS vendor. These reviews will cover all technical and contractual issues, and will assess progress against statement of work and specification requirements and against the project schedule.

(7) Other meetings. The STVS project manager may schedule additional meetings (e.g., technical interchange meetings) involving Government and contractor personnel as required to cover subjects of immediate interest or importance.

b. Newsletter. The Terminal Voice Switch Reporter is published every two months by ANC-200, and provides news and information of a general nature concerning terminal voice switching systems including STVS. This newsletter is mailed to all regional offices and selected FAA headquarters and FAA Technical

Center offices. Inquiries or requests for additional copies can be directed to ANC-200.

c. Bulletin board system. ANC-200 has developed a bulletin board system (BBS), which will reside on the FAA.MAIL administrative data transmission network (ADTN). This BBS, which will be accessible via asynchronous dial-up (personal computer) modems, enables field personnel to ask questions and receive responses with greater speed than traditional written correspondence, as well as more detail and greater responsiveness than telephone inquiries. The BBS also provides file space for the storage and downloading of important files (including text of important documents, spreadsheets, data bases, etc.).

55. IMPLEMENTATION STAFFING. The following personnel play key roles in STVS implementation.

a. Quality and Reliability Officer (QRO). The Industrial Division (ASU-400) will assign a QRO to the STVS contract. The STVS contracting officer will delegate responsibility to the QRO to represent the contracting officer at the contractor's plant. The QRO will work closely with the contractor in the inspection and acceptance of all STVS equipment at the factory. The QRO will:

- (1) Monitor factory verification in compliance with contract requirements.
- (2) Monitor production progress.
- (3) Monitor fulfillment of the STVS vendor's quality program plan.
- (4) Expedite delivery of STVS equipment.
- (5) Coordinate any proposed technical changes with the contracting officer and ANC-200.
- (6) Provide the contracting officer and ANC-200 copies of vendor documentation and correspondence.
- (7) Provide weekly status reports to the contracting officer and to ANC-200.

b. Technical Officer (TO). The contracting officer will assign a TO to assist in all administrative and technical matters with the contractor. The TO will:

(1) Keep the contracting officer and ANC-200 informed of the status of work in progress, and all technical and contractual difficulties encountered.

(2) Provide the contracting officer and ANC-200 with notification of meetings and copies of all correspondence related to STVS implementation.

(3) Provide the regions with important STVS documentation including the Project Implementation Plan (PIP) and Master Test Plan (MTP).

c. Regional personnel. The appropriate branch of each region's Airway Facilities Division (AXX-400) will have primary responsibility for STVS implementation activities in that region. The regions will:

- (1) Assign a technical onsite representative (TOR) for each STVS site within the region.
- (2) Ensure that the engineering activities outlined in chapter 7 have been completed.
- (3) Participate in site verification and commissioning activities as described in chapter 8.
- (4) Ensure that logistics needs (maintenance, training, spares, tools and test equipment, documentation, etc.) are identified and met for each site.
- (5) Inform the TO whenever technical and contractual difficulties are encountered.

d. Technical Onsite Representative (TOR). For each STVS installation, the region in charge will appoint a TOR, who will witness and participate in the installation, integration, and verification activities at each STVS site. The TOR will:

- (1) Serve as the central point of contact for all matters pertaining to site installation activities.
- (2) Identify and coordinate with personnel who will participate in site preparation and installation efforts.
- (3) Provide the installation personnel with access to the site.
- (4) Ensure that contractor installation procedures meet FAA standards.

(5) Inform the region whenever technical and contractual difficulties are encountered.

(6) Inform the region as to the status of site preparation, equipment deliveries, and installation progress.

(7) Identify power and grounding connection points, internal facility cable raceways, and buried or hidden utility conduits that would affect the installation effort.

(8) Ensure availability of adequate power supplies for A/G radio control equipment and door unlock solenoid.

(9) Assist in verification of proper performance of the STVS during site testing.

e. Associate Program Manager for Test (APMT). The Director of the Engineering, Test and Evaluation Service, ACN-1, will appoint an APMT to oversee the STVS test and evaluation (T&E) program. The APMT will:

(1) Review T&E plans and procedures.

(2) Coordinate with supporting organizations regarding all T&E activities.

(3) Review site acceptance plans and procedures.

(4) Monitor and witness all contractor-performed testing.

(5) Develop and maintain operational test and evaluation (OT&E) integration test plans, procedures, and reports.

(6) Conduct FAA OT&E/integration testing.

(7) Monitor FAA OT&E/shakedown testing.

(8) Review and analyze contractor-generated test results and test reports.

(9) Develop and distribute OT&E/integration test reports.

56. PLANS AND REPORTS.

a. Project Implementation Plan (PIP). The PIP (this order) has been prepared and will be maintained by ANC-200. The PIP provides technical guidance and management direction for the orderly implementation of STVS.

b. FAA Master Test Plan (MTP). The FAA MTP will be prepared jointly by ANC-200 and the Engineering Test and Evaluation Service, Automation Division (ACN-100), and will serve as a top-level description of the STVS T&E program. ANC-200 and ACN-100 will coordinate the development and approval of the FAA MTP with the Test Policy Review Committee (TPRC) in accordance with the current version of Order 1810.4, FAA NAS Test and Evaluation Program. The FAA MTP will coordinate the efforts of all organizations involved in the verification of the STVS and will outline the T&E tasks necessary to support STVS implementation and deployment.

c. Project Management Plan. The STVS vendor will develop and maintain a project management plan in accordance with contractor data requirements list (CDRL) item A-01. ANC-200 will have primary responsibility for the review and approval of the project management plan.

d. Contractor Master Test Plan (CMTP). The contractor MTP will be prepared by the STVS vendor. This plan will serve as a top-level description of the contractor's overall T&E activities. ANC-200, ACN-100, and the National Engineering Field Support Division (ASM-600) will be responsible for reviewing and approving the CMTP.

e. Site Installation Management Plan. The site installation management plan will be prepared and maintained by the STVS vendor. This plan will provide a top-level description of all of the contractor's site installation activities. ANC-200 and ACN-100 will be responsible for reviewing and approving the site installation management plan.

f. Site Installation, Integration, and Acceptance Plan. The STVS vendor will develop site installation, integration, and acceptance plans for each site. ANC-200, ACN-100, ASM-600 and the appropriate AXX-400 branch will be responsible for reviewing and approving these plans. ANC-200 will ensure that each region is furnished with copies of the plans for sites in their jurisdiction.

g. Integrated Logistics Support Plan. The STVS integrated logistics support plan (ILSP) provides a top-level description of the support concept to be followed by the FAA vendor in the deployment of the STVS. ANS-420, assisted by the NAILSMT, is responsible for preparing the ILSP and recommending approval of the document jointly with ANC-200.

h. Configuration Management Plan. The STVS vendor will develop an STVS configuration management plan in accordance with FAA-STD-021a, Configuration Management, and CDRL item B-01. This plan will document all contractor configuration management responsibilities and procedures. ANC-200 and ASE-600 will be responsible for reviewing and approving the configuration management plan.

i. OT&E/Integration Test Plan. ACN-100 will develop an OT&E/integration test plan in accordance with FAA-STD-024a, Preparation of Test and Evaluation Documentation. This plan will specify the activities to be performed during OT&E/integration testing. The plan will contain a test verification requirements traceability matrix (TVRTM) specifying the test procedures and verification methods to be used to satisfy each allocated requirement.

j. OT&E/Shakedown Test Plan. ASM-600 will develop an OT&E/shakedown test plan in accordance with FAA-STD-024a. The OT&E/shakedown tests are intended to exercise the STVS in an operational environment to determine whether it is ready for deployment. The OT&E/shakedown test plan will identify procedures that will be used to identify possible operational deficiencies in the areas of training, logistics, documentation, personnel safety, security, software, preventive maintenance, field maintenance, and failure detection and recovery procedures. This testing will be conducted at the first operational site and must be satisfactorily completed before the deployment readiness review (DRR) executive committee meeting (at which the deployment decision will be made).

k. Problem Reports. For each STVS site, regional personnel will maintain an installation log of open items (problems that require resolution) throughout the implementation effort, and will incorporate this information into a quarterly report to be submitted to the TO. In such reports, the TOR will identify any problems encountered and the solutions proposed by the STVS vendor.

l. Project Status Reports. The STVS vendor will prepare project status reports and milestone schedules each month in accordance with CDRL item A-03 to inform the FAA of the status of the project schedule, to identify problem areas and proposed solutions, and to report on efforts to implement the solutions. These reports will identify all problem areas and will assess the project's progress against established milestones. Project status reports will be submitted to the TO for consolidation and discrepancy identification.

m. Site Survey Reports. The STVS vendor will deliver site survey reports to the TO for each site in accordance with CDRL item E-02. These reports will list actions to be taken to install the STVS at the site.

n. Test reports. The STVS vendor will prepare test reports in accordance with CDRL C-03 to document the results of formal system testing. Test reports will also be prepared by ACN-100 for OT&E/integration testing and by ASM-600 for OT&E/shakedown testing.

57. APPLICABLE DOCUMENTS. The following documents have been referred to in this order.

a. FAA specifications.

FAA-E-2162B	Microphone, Hand-Held
FAA-D-2494b	Technical Instruction Book
	Manuscripts: Electronic,
	Electrical, and Mechanical
	Equipment, Requirements for
	Preparation of Manuscript and
	Production of Books
FAA-E-2603A	Noise Canceling Headset and
	Handset
FAA-E-2874	Small Tower Voice Switch
	Specification

b. FAA orders.

1800.63	National Airspace System (NAS)
	Deployment Readiness Review
	(DRR) Program.
1810.4	FAA NAS Test and Evaluation
	Program
4800.2A	Utilization and Disposal of
	Excess and Surplus Property
6030.45	Facility Reference Data File

c. FAA standards.

FAA-STD-019b	Lightning Protection, Grounding,
	Bonding and Shielding
	Requirements for Facilities.
FAA-STD-021a	Configuration Management
FAA-STD-024a	Preparation of Test and
	Evaluation Documentation

58.—59. RESERVED.

CHAPTER 6. PROJECT FUNDING

60. FUNDING SOURCES. The STVS project receives facilities and equipment (F&E) funding from two main sources. The replacement of voice switching systems in existing towers is funded by project 22-12 of the Capital Investment Plan (CIP), the terminal voice switch replacement program, while the provision of voice switching systems for new, modernized, or relocated towers is funded by the ATCT/Terminal Radar Approach Control (TRACON) Establishment, Replacement, and Modernization program (CIP project 22-13). Both of these programs have designated funding for specific lists of sites; sites requiring STVS that do not appear on this list will have to be coordinated for inclusion with ATR-100. Table 6-1 shows the initial baselined list of STVS sites with regional site preparation funding identified.

61. FUNDING LEVELS AND STATUS. Detailed information about STVS funding can be obtained from ANC-200.

62. SCOPE OF FUNDING.

a. Vendor funding. Funds provided to the STVS vendor by ANC-200 will be used for the following:

- (1) STVS equipment, including initial quantities of headsets, handsets, and foot switches.
- (2) Turnkey installation (excluding site preparation).
- (3) Site- and depot-level spares kits.
- (4) Special tools and test equipment.
- (5) Technical documentation for training, operation, and maintenance.

(6) Onsite training of Government personnel (operators and maintainers).

(7) Onsite and telephone support for FAA site-level maintenance.

(8) Site-level maintenance (only if FAA site-level maintenance is not practical).

(9) Depot-level maintenance.

(10) Project management.

(11) Configuration management.

(12) Participation in system review, technical interchange meetings, logistics conferences, and other meetings.

(13) Factory and site testing.

b. Regional funding. Funds provided to regional offices by ANC-200 will be used for materials required during site preparation (including such items as grounding equipment, consoles and racks, bypass communication's jack hardware, etc.). The regions must program any additional funding required under activity 8 for labor and travel costs associated with site preparation. Site preparation funding has been provided for an initial list of STVS sites. This list is shown in table 6-1.

c. ASM-600 funding. Funds provided to ASM-600 by ANC-200 will be used for OT&E shakedown test team preparation meetings, training, and shakedown test performance.

63.—69. RESERVED

Table 6-1: STVS SITE PREPARATION FUNDING

Region	Location	Delivery	Funding	Region	Location	Delivery	Funding
ACE	Olathe (Executive)	5/1/93	\$15,000	ANM	Tacoma Narrows	4/1/93	\$15,000
ACE	Salina	8/1/93	\$15,000	ANM	Ogden	5/1/93	\$15,000
ACE	Hutchinson	9/1/93	\$15,000	ANM	Pendleton	6/1/93	\$15,000
ACE	Topeka (Forbes)	10/1/93	\$15,000	ANM	Lewiston	8/1/93	\$15,000
AEA	Lancaster	1/1/93	\$15,000	ASO	Key West	3/1/93	\$15,000
AEA	Wheeling	4/1/93	\$15,000	ASO	Panama City	3/1/93	\$15,000
AEA	Parkersburg	8/1/93	\$15,000	ASO	Jacksonville CR	5/1/93	\$15,000
AEA	Williamsport	10/1/93	\$15,000	ASO	Meridian (Key)	5/1/93	\$15,000
AEA	Hagerstown	11/1/93	\$15,000	ASO	Ft. Lauderdale (Exec)	9/1/93	\$15,000
AEA	Morgantown	12/1/93	\$15,000	ASO	Greenville (downtn.)	9/1/93	\$15,000
AGL	Bloomington	7/1/93	\$15,000	ASW	San Angelo	4/1/93	\$15,000
AGL	Jackson	9/1/93	\$15,000	ASW	Santa Fe	7/1/93	\$15,000
AGL	Cleveland (CUY)	11/1/93	\$15,000	ASW	Alex. (Elser)	10/1/93	\$15,000
ANE	Norwood	6/1/93	\$15,000	ASW	San Antonio (Stinson)	11/1/93	\$15,000
ANE	Veverly	8/1/93	\$15,000	ASW	Enid	12/1/93	\$15,000
				AWP	Lancaster	5/1/93	\$15,000

CHAPTER 7. DEPLOYMENT

70. DEPLOYMENT READINESS REVIEW. The DRR is the primary vehicle for planning system deployment; it will ensure that the STVS is ready for deployment to the field. Order 1800.63, National Airspace System (NAS) Deployment Readiness Review (DRR) Program, latest revision, provides the policy as well as the programmatic aspects, where the program manager leads the FAA review to ensure the project is ready to be integrated into the NAS, and that the FAA is ready to receive, utilize, and provide life-cycle support. The Planning Branch, AAF-11, supports the program manager's DRR efforts, assures conformance to and management of DRR program per Order 1800. 63.

a. DRR Process Milestones (for Subsystem Acquisition Without Software Development):

- (1) Validate the DRR items in the solicitation package (pre-DRR process)
- (2) Initiate the DRR process (a preparation meeting with the project manager (16 months prior to delivery to the OT&E test site.
- (3) Prepare initial checklist and announce the DRR team meeting (14 months prior to delivery to OT&E test site).
- (4) Conduct the DRR team meeting (12 months prior to delivery to the OT&E test site).
- (5) Baseline the DRR checklist (within 30 days following the DRR team meeting).
- (6) Conduct monthly project checklist reviews (every 30 days following the DRR team meeting). Revise the checklist not less than once every 60 days.
- (7) Perform mid-term review, when significant changes have occurred in the program, for example, a significant change in quantities or locations, or a major engineering change is approved.
- (8) Delivery to the OT&E test site.
- (9) Complete OT&E testing.
- (10) Conduct a TELCON approximately 10 days after the completion of OT&E shakedown testing.
- (11) Brief the DRR report to AAF-1 (prebrief).

(12) Conduct the DRR Executive Committee (EXCOM) for a deployment decision.

(13) Provide open action item status reports (approximately every 60 days following deployment decision) until completion.

(14) Conduct a post deployment review.

b. DRR Checklist. The DRR covers all aspects of deployment. Areas of consideration under deployment track the DRR checklist. Sections of the DRR checklist are provided in subparagraphs b(1) through b(15).

- (1) NAS and subsystem requirements.
- (2) Contract status.
- (3) Project implementation.
- (4) Facility/site preparedness.
- (5) Telecommunications requirements.
- (6) NAS integrated logistics support. (NAILS)
- (7) Software (firmware) support.
- (8) Training.
- (9) Staffing.
- (10) Quality assurance.
- (11) Configuration management.
- (12) Test program.
- (13) Automated information systems security effectiveness.
- (14) Other coordination.
- (15) Human factors.

71. SITE PREPARATION AND SITE SURVEY. Site preparation involves repairs, refurbishments, and other actions to make the site ready to accept the installation of STVS.

a. Site preparation funding. ANC-200 will fund all materials and parts for site preparation. Initially, ANC-200 will issue project authorizations (PA) for small dollar amounts as early as possible to establish the site preparation effort formally as an activity to which regions may then allocate F&E engineering resources. To obtain additional funding for site preparation materials and equipment, regions must submit detailed site-specific cost estimates. Note that site preparation funds provided by ANC-200 are to be used for materials only, and not for labor.

b. Site preparation tasks. The region is responsible for managing the engineering and accomplishing the site preparation as outlined in subparagraphs (1) – (12) and for overseeing STVS site preparation as outlined in paragraph 55d. The region will be responsible for:

(1) Determining material shortfalls based on review of STVS Project Material List (PML) data and generating project status reports. Project specific Project Status Reports (PSR) will be established as required by the regional F&E personnel. In order to establish a material requirements baseline, a PML for the STVS will be loaded into the FAA Logistics Center resident Project Material Management System (PMMS). Any shortfalls in material needs for regions and individual sites that exist will be determined from PMMS data. Because the STVS is a turnkey procurement, the PML is expected to consist of the basic equipment only. PSRs will be initiated as required following review of the PML data by regional and site F&E personnel.

(2) Removing existing equipment (see paragraph 95).

(3) Providing necessary floor space for STVS installation.

(4) Providing, where possible, an individual AC power distribution panel solely for the STVS equipment (to reduce the incidence of audio noise induced by power line noise).

(5) Providing DC power supplies for local radio control and telephone circuit ringing.

(6) Ensuring adequate electrical grounding in accordance with FAA-STD-019b, Lightning Protection Grounding, Bonding, and Shielding, and FAA-STD-020, Transient Protection, Grounding, Bonding, and Shielding, by conducting a comprehensive grounding survey and making necessary upgrades or replacements.

(7) Providing a signal ground plate (single-point ground) and a chassis ground plate (multi-point ground) for the STVS equipment.

(8) Ensuring that common carriers (i.e., telephone companies) have installed suitable signal grounds for each incoming telephone circuit (to avoid ground potential differences between STVS and the telephone circuits, the carrier ground should be connected to the STVS signal ground).

(9) Providing workspace for site survey meetings and site preparation activities.

(10) Ensuring that all communications circuits (telephone lines, local connections for direct line or air-ground communications, etc.) meet the requirements of the STVS transmission plan.

(10) Providing to the TOR all approved documentation required for implementation, including telecommunications service requests (TSR), site survey reports, instruction books and site installation, integration, and acceptance plans.

(11) Installing bypass communication jacks as required (see paragraph 100).

(12) Ensuring adequate primary lightning protection for the facility and for external lines (both telephone company lines and FAA-owned lines) in accordance with FAA-STD-019b.

c. FAA site survey. The purpose of the FAA site survey for STVS is to identify the baseline system configuration required for the site; this information will be used by the STVS vendor in constructing and assembling an appropriate system for the site. The FAA site survey will be conducted jointly by the appropriate AXX-400 and AXX-500 branches of the region responsible for the site. The site survey will require the completion of questionnaires or order sheets to be provided by the STVS vendor. Upon completion of the FAA site survey materials, AXX-400 and AXX-500 will meet with the TOR, local air traffic, and airway facilities personnel to finalize the survey materials. The survey should then be forwarded to ANC-200, which will initiate the order for the necessary equipment. The FAA site survey requires special care, because in most cases there will be no follow-up vendor site survey; the success of the installation effort will depend directly on the accuracy and completeness of the FAA site survey data.

Data to be furnished for the site survey will include:

(1) Number and type of each telephone circuit (for G/G communications) to be connected to the STVS.

(2) Other G/G circuits to be connected to the STVS (e.g., direct lines to fire and rescue, door intercom, operational support telephone system trunks).

(3) Number and configuration of A/G frequencies to be connected to the STVS.

(4) Assignment of circuits and frequencies to positions.

(5) Assignment of certain special features (e.g., monitoring) to positions.

(6) Facility layout information, including location reserved for STVS equipment; power, grounding, and communications line attachments; and, cabling routes.

(7) Name and telephone number of site TOR, if available, or else the name and telephone of a regional representative with whom implementation issues may be coordinated until a TOR is named.

(8) The need for concurrent ATS installation. Some sites may have ATS systems integral to the current switching system. These ATSs could be incompatible with the STVS. The need for concurrent ATS installation with STVS should be identified in these cases.

d. Contractor's site survey. Where required (e.g., due to special conditions at the site), ANC-200 may request the STVS vendor to perform a separate site survey to determine whether a site is ready for STVS installation. This site survey will be performed by the vendor under supervision of the appropriate AXX-400 division. The vendor will provide a site survey report focusing on the following:

(1) Availability and routing of power lines.

(2) Availability and routing of communications and signaling lines.

(3) Cabling, ducting, and grounding.

(4) Status of prerequisite site preparation work.

72. DELIVERY. The following paragraphs list the responsibilities of the STVS vendor and the TOR for delivery of the STVS to designated sites.

a. STVS vendor responsibilities. The vendor will:

(1) Contact the TOR or other designated AXX-400 representative (see subparagraph 71c(7)) by letter to request a suitable date and time for delivery, and to obtain delivery instructions.

(2) Provide names of installation team members and identify requirements for parking.

(3) Assemble and pack all STVS material and equipment in accordance with the contract and ship it from the vendor's facilities to each designated STVS facility.

(4) Unload all STVS material and equipment and place it (if necessary) into temporary storage at the STVS facility (i.e., at the loading dock).

(5) Move all STVS material and equipment to the installation area designated by the TOR.

(6) Unpack, inspect, inventory, and secure all STVS material and equipment to make it ready for installation.

(7) Provide all personnel and equipment (including vehicles, hand trucks, dollies, tools, etc.) needed to carry out the above items.

(8) Dispose of all packing materials and other waste in accordance with the instructions of the TOR.

b. FAA Responsibilities. The regions will:

(1) Coordinate date and time of delivery with vendor, and provide delivery instructions.

(2) Ensure that site survey activities are complete in accordance with paragraph 71.

(3) Arrange off-loading facilities for STVS material and equipment deliveries.

(4) Arrange parking for installation team vehicles.

(5) Ensure that equipment can be moved directly to installation area, or if not, arrange for temporary storage space.

(6) Identify delivery routes within the STVS facility to the installation areas and arrange for necessary facility access for installation team members.

(7) Arrange for disposal of packing materials and other waste.

73. INSTALLATION. The subparagraphs 73a and 73b identify the responsibilities of the STVS vendor and the TOR for system installation. Detailed installation procedures will be identified after contract award.

a. STVS vendor responsibilities. The STVS vendor will:

(1) Connect equipment to the AC power distribution panel and facility ground as instructed by the TOR.

(2) Install all system wiring, including intra-building cable runs.

(3) Connect equipment to facility power supply and grounding network.

(4) Connect external interfaces (e.g., telephone

lines), providing intermediate wiring as stipulated in the contract and the approved site installation plan.

(5) Affix labels, signs, or other identifiers as required for the use of operators and maintainers.

(6) Supply all tools, equipment, and materials needed to accomplish the tasks in subparagraphs 73a(1) through 73a(5).

(7) Minimize disruption to other facility construction efforts or to ongoing Government operations.

b. TOR responsibilities.

(1) Review site installation plan with installation team before start of work.

(2) Supervise all installation efforts and provide facility escorts as required.

(3) Arrange access for installation team to install intra-building cable runs (e.g., in cable trays, above ceiling, below floor, etc.).

(4) Coordinate installation team's efforts with other ongoing activities (e.g., other construction efforts or Government operations).

74.—79. RESERVED.

CHAPTER 8. VERIFICATION

80. VERIFICATION—GENERAL. The purpose of verification activities is to ensure that the STVS will meet the requirements set forth in the STVS contract (including the specification, statement of work, and related documents), that it has been installed and integrated in accordance with contract requirements, and that it will be able to fulfill its designated mission. The STVS will be subjected to factory-level and site-level verification, as well as shakedown and integration testing; this testing will culminate in successful system acceptance and cutover, and closure of appropriate DRR action items leading to DRR EXCOM approval for continued deployment. In general, testing performed before system acceptance is performed by the STVS vendor (with appropriate Government witnesses) according to the approved CMTP, while testing performed after system acceptance is led by an appropriate Government official (usually the designated site TOR), with the contractor providing only technical support.

81. FACTORY VERIFICATION. Under the supervision of FAA personnel (primarily representatives of ANC-200, ACN-100, and the QRO, ASU-424A), the STVS vendor will conduct factory verification. This paragraph describes the factory verification activities and the roles and responsibilities of the STVS vendor and Government personnel.

a. Factory verification activities.

(1) First unit testing. The purpose of first unit testing is to demonstrate full compliance with the requirements of FAA-E-2874 by comprehensively testing the first production STVS. First unit testing will be conducted according to test procedures published in the approved CMTP, in the presence of Government representatives (ANC-200, ACN-100, and the QRO, ASU-424A). The following special tests called out in FAA-E-2874 will be included in the first unit testing:

(a) System maintainability demonstration.

(b) Electrostatic discharge testing.

(2) Factory acceptance testing. The STVS vendor will conduct factory acceptance testing on each unit to ensure that it performs in accordance with FAA-E-2874. Factory acceptance testing will be conducted according to test procedures published in the approved

CMTP. The Government may, if desired, request to have its representatives witness factory acceptance testing.

b. Roles and responsibilities for factory verification.

(1) STVS vendor responsibilities. For factory verification activities, the STVS vendor will:

(a) Develop test scenarios and procedures and publish them in the CMTP for Government approval.

(b) Provide all equipment, software, tools, test equipment, and emulation equipment (i.e., for external interfaces) required for factory verification.

(c) Conduct all factory verification activities in the presence of Government witnesses.

(d) Log all test results and produce test reports in accordance with the STVS contract.

(2) ANC-200 responsibilities. For factory verification activities, representatives of ANC-200 will:

(a) Review and approve contractor test plans and procedures.

(b) Participate in and observe testing.

(c) Attend test reviews and briefings.

(3) ACN-100 responsibilities. For factory verification activities, representatives of ACN-100 will:

(a) Review and approve the STVS vendor's test plans and procedures.

(b) Participate in and observe testing.

(c) Attend test reviews and briefings.

(d) Ensure that test failures are analyzed, that necessary corrections are made, and that retesting is completed.

(4) ASM-600 responsibilities. For factory verification activities, representatives of ASM-600 will observe testing.

(5) QRO responsibilities. For factory verification activities, the QRO will:

(a) Monitor fulfillment of the STVS vendor's quality program plan.

(b) Participate in and observe all testing.

(c) Attend test reviews and test briefings.

(d) Ensure that test failures are analyzed, that necessary corrections are made, and that retesting is completed.

82. SITE VERIFICATION ACTIVITIES. The STVS vendor will conduct site verification at each site to ensure that equipment is correctly installed and configured, fully operational, and ready for transfer to the Government. Site verification will be conducted according to test procedures published in the CMTP, in the presence of the TOR and other Government representatives as designated.

a. STVS vendor responsibilities. For site verification, the STVS vendor will:

(1) Develop test scenarios and procedures and publish them in the CMTP for Government approval.

(2) Provide all equipment, software, tools, test equipment, and emulation equipment (i.e., for external interfaces) required for site verification.

(3) Conduct all site verification activities in the presence of the TOR or other designated Government personnel.

(4) Log all test results and produce test reports in accordance with the STVS contract.

b. TOR responsibilities. For site verification, the designated TOR will:

(1) Review and approve contractor test plans and procedures.

(2) Ensure that vendor has made sufficient effort to minimize the impact of site verification on ATC facility operations.

(3) Participate in and observe site verification activities.

(4) Ensure that test failures are analyzed, that necessary corrections are made, and that retesting is completed.

(5) Record all data necessary for completion of further site verification activities.

c. ACN-100 responsibilities. For the first STVS installation only, a representative of ACN-100 will serve as TOR and will perform the duties listed in subparagraph 82b.

d. ANC-200 responsibilities. ANC-200 will provide technical support to the regions for site verification, including training and orientation, and provision of technical data. Generally, ANC-200 representatives will not attend site testing unless required to expedite successful test completion and acceptance.

83. NAS OT&E/INTEGRATION TESTING. For the first STVS site, or other key site to be designated, ACN-100 will perform NAS OT&E/integration testing on an STVS that has successfully passed site verification. The purpose of integration testing is to ensure that the STVS will operate effectively with the variety of external equipment to which it will be connected. The STVS vendor generally will not be involved in NAS integration testing, although there are provisions in the STVS contract for the vendor to provide limited engineering support as may be required. For NAS integration testing, ACN-100 will:

a. Ensure that all necessary equipment, tools, and emulation equipment are available.

b. Ensure that the impact of testing on ATC facility operations is minimized.

c. Develop test procedures which verify the user requirements from the FAA MTP. Approved CMTP test procedures developed for contractor integration testing may be used as applicable.

d. Conduct testing, assisted by other Government personnel as required.

e. Ensure that test failures are analyzed, that necessary corrections are made, and that retesting is successfully completed.

f. Report NAS integration test results.

84. SHAKEDOWN TESTING. For the first STVS site, or other key site to be designated, ASM-600 will perform shakedown testing on an STVS that has successfully passed site verification. The purpose of shakedown testing is to ensure that the STVS performs reliably, meets operational requirements, and can be maintained under actual ATC facility working conditions. The STVS vendor generally will not be involved in shakedown testing, although there are provisions in the STVS contract for limited engineering support as may be required. For shakedown testing, ASM-600 will:

- a. Ensure that all necessary equipment and tools are available.
- b. Ensure that the impact of testing on ATC facility operations is minimized.
- c. Use approved CMTP test procedures and develop new procedures as necessary.
- d. Ensure adequacy of shakedown prerequisites such as operator and maintenance training, availability of spares, special tools, and test equipment, etc.
- e. Conduct tests, assisted by other Government personnel as required.

f. Ensure that test failures are analyzed, that necessary corrections are made, and that retests are successfully completed.

g. Report shakedown test results (in particular, to the DRR EXCOM).

85. JOINT ACCEPTANCE INSPECTION (JAI).

The Government will conduct JAI at each STVS site in accordance with Order 6030.45, Facility Reference Data File. The purpose of JAI is to submit the STVS formally to the operational services (AT and AF) for use in the NAS. The date of a favorable JAI decision will be considered to be the date of the operational readiness demonstration (ORD), and the status of the system will be noted in the facilities master file as of this date. The JAI team will be chaired by a representative of the local maintenance sector field office, and will consist of representatives of the following organizations at a minimum:

- a. Site TOR.
- b. AXX-500.
- c. AXX-400.

86.—89. RESERVED.

CHAPTER 9. INTEGRATED LOGISTICS SUPPORT

90. MAINTENANCE CONCEPT. Two levels of maintenance are envisioned for the STVS: field level maintenance (the removal and replacement onsite of failed components or line replaceable units to restore system operation), and depot-level maintenance (the diagnosis and repair of failed line replaceable units at a central depot facility).

a. Field Level Maintenance. Field level maintenance involves the diagnosis, identification, removal, and replacement of failed line replaceable units). Field level maintenance also includes the performance of any required preventive maintenance and periodic inspections. It is anticipated that the FAA will perform all field level maintenance through its Airway Facilities maintenance work force. Technicians will be given training and instruction books, and spares will be stored at maintenance sector field offices or at STVS sites as appropriate. The STVS contract contains provisions (priced on a per-site, per-year basis) to allow the vendor to take over site maintenance at any site if the Government deems it necessary.

b. Depot-level maintenance. Depot-level maintenance involves the repair of defective line replaceable units identified during site maintenance. It is anticipated that the vendor will perform all depot-level maintenance throughout the lifetime of the equipment. ANC-200 will fund the first year of depot maintenance for each system through the STVS contract, while the FAA Logistics Center will establish a national level depot maintenance contract to cover all systems each year thereafter. The Government retains a contract option to purchase the proprietary data and equipment required to perform in-house depot maintenance, but it is unlikely that the Government will need to exercise this option. It is believed that the cost to replace STVS will be less than the cost to assume depot maintenance for an equivalent period. The STVS contract calls for two levels of priority for depot-level maintenance:

(1) Emergency replacement. Fully operational components are shipped by the vendor directly to the site where they are required, within 24 hours of notification by the designated FAA Logistics Center official.

(2) Routine repair. The vendor repairs, tests, and ships line replaceable units back to the FAA Logistics Center within 30 days of receipt.

c. Technical assistance. The STVS contract contains provisions for the vendor to provide the following forms of technical assistance for FAA maintenance personnel:

(1) Telephone assistance. The vendor will establish a toll-free telephone advisory service, available 24 hours per day, staffed by the vendor's technical staff. This support will be made available within 2 hours of request by the designated National Engineering Field Support Division (ASM-600) official.

(2) Onsite assistance. The STVS vendor will provide onsite assistance from members of the vendor's technical staff. This support will be made available within 24 hours of request by the designated ASM-600 official.

(3) Engineering support. The STVS vendor will provide detailed engineering support as required for STVS hardware. Typically, this support is required more for second-level engineering activities than for routine site maintenance.

d. Reliability assurance period. The STVS contract requires the vendor to provide the first year's depot maintenance for each site as part of the basic contract. This provision serves both to reduce Government risks due to equipment unreliability, and to allow for reliability improvements to the entire STVS fleet. The first year of depot maintenance will commence after contractor acceptance inspection (CAI). During this period, the vendor will analyze failures that occur and propose modifications for incorporation into future equipment as well as systems that have already been installed.

91. TRAINING. All training courses for the STVS are to be conducted by the STVS vendor, using existing (non- developmental) training materials approved by the Government. The FAA Academy will be responsible for developing attrition training packages for Air Traffic & Airway Facilities personnel using materials provided by ANC-200 and obtained from the STVS vendor. The following courses will be conducted by the vendor:

a. STVS orientation course. The STVS orientation course will be conducted at the vendor's facilities for up to 12 students per class. The intended audience consists of key regional personnel responsible for the delivery, installation, and site acceptance testing of the STVS. The course will cover basic system functionality, the delivery/installation/site testing process, and roles and responsibilities of the parties involved.

b. On-the-job training (OJT) operator/supervisor course. This course will be conducted at the STVS site for up to 12 students per class. The intended audience consists of air traffic controllers and supervisors who will use the STVS during the course of their work. The course will train operators on how to use the STVS, as well as how to identify and recover from basic system faults and outages.

c. OJT hardware maintenance course. This course will be conducted at the STVS site for up to 12 students per class. The intended audience consists of local Airway Facilities maintenance technicians who will perform site maintenance on STVS equipment. The course will train maintenance personnel on performing site-level maintenance, including troubleshooting, repair, and testing. The course will also cover any required periodic maintenance.

d. Engineering services support course. This course will be conducted at the vendor's facilities for up to 12 students per class. The intended audience consists of Government engineering field service specialists (ASM-600) who will provide second-level engineering support for FAA maintenance activities. In addition, training slots (three-four) will be available for F&E engineers. The curriculum will be generally similar to that of the OJT hardware maintenance course, but will include more detailed information on system design and operation.

e. Depot maintenance training. This course is an STVS contract option to be exercised only if the Government decides to assume depot-level maintenance of STVS. The course will be conducted at the vendor's facilities for up to five students per class. The intended audience consists of maintenance technicians at the FAA Logistics Center who will perform depot-level maintenance of STVS. The course will provide detailed information on the design, operation, testing, and repair of the STVS, including orientation on any special test equipment used for depot-level maintenance.

92. SUPPORT TOOLS AND TEST EQUIPMENT.

The STVS vendor will document all tools and test equipment required for STVS maintenance, including special tools and test equipment (i.e., those intended for use only in STVS maintenance activities). Common tools and test equipment (e.g., multimeters and hand tools) may be obtained through a variety of outside sources. The vendor will deliver complete sets of special tools and test equipment as ordered, with quantities and locations to be determined at the STVS provisioning conference.

93. SUPPLY SUPPORT. The vendor will furnish all spare parts, including site spares kits. The vendor will maintain the inventory of depot spares at its facilities. Sparing requirements for depot levels will be determined at the STVS provisioning conference. Sparing requirements at site levels will be determined in conjunction with the vendor, Program Manager, Associate Program Manager for Logistics, and the Facilities Engineering Branch Manager.

94. VENDOR DATA AND TECHNICAL MANUALS.

a. Standard manuals. The STVS vendor will provide the following standard manuals. These will be prepared (or tailored) using FAA-D 2494b as a guide, and will be delivered as ordered. There will be no restriction on the reproduction of any such data and manuals. The manuals to be delivered include:

- (1) Technical instruction books to support site-level maintenance and field engineering activities.
- (2) Operator manuals explaining the operation of the STVS.
- (3) Firmware support manuals (if required) explaining how to reprogram any system firmware that might be used with the STVS (e.g., to store system configuration).

b. Life-cycle parts and service data. Should the Government decide to assume responsibility for depot-level maintenance of STVS, the STVS contract contains an option to purchase from the vendor all data (including proprietary data) on system design, construction, and operation needed for depot-level maintenance.

95. EQUIPMENT REMOVAL. The regions will dispose of equipment (i.e., old voice switching gear) removed to make way for STVS in accordance with

Order 4800.2A, Utilization and Disposal of Excess and Surplus Property. If leased equipment is displaced by STVS, regions should submit a TSR to DECCO for removal of the equipment. Sufficient lead time should be allotted to process the TSR and permit removal of equipment as soon as possible after the STVS is commissioned (JAI/ORD).

there are no facility impacts or considerations due to STVS.

97.—99. RESERVED.

96. FACILITIES. The regions will accomplish the site preparation tasks listed in paragraph 71. Otherwise,

CHAPTER 10. ADDITIONAL ASPECTS

100. BYPASS COMMUNICATIONS JACKS.

Following contract award, data will be available on the detailed description and engineering data package for bypass communication jacks.

101. FUTURE EXPANSION. Data will be provided on future expansion of the baseline STVS, following contract award.

102.--199. RESERVED.

APPENDIX 1. ABBREVIATIONS AND ROUTING SYMBOLS

AAC-400	FAA Logistics Center	(unspecified region)
AAF-11	Airway Facilities Service Planning Branch	AXX-500 Air Traffic division (unspecified region)
AC	alternating current	
ACN-100	Engineering Test and Evaluation Service, Automation Division	BBS bulletin board system
ADTN	administrative data transmission network	C Celsius (unit of temperature)
AF	Airway Facilities	CAI contractor acceptance inspection
AFS-1	Flight Standards Service	CDRL contract data requirements list
A/G	air-ground	CIP Capital Investment Plan
AHT-400	Office of Training and Higher Education, Airway Facilities Training Program Division	CMTP contractor's master test plan
AHT-500	Office of Training and Higher Education, Air Traffic Training Program Division	dc direct current
ASU-1	Office of Acquisition Support	DECCO Defense Commercial Communications Office
ANC-200	Voice Switching and Recording Program	DRR deployment readiness review
ANS-200	NAS Transition and Implementation Service, Facility Programs and Transition Division	ERMS environmental remote monitoring
ANS-240	NAS Transition and Implementation Service, Airport Traffic Control Tower/TRACON Program Office	EXCOM executive committee
ANS-420	NAS Transition and Implementation Service, National Airspace Integrated Logistics Support Implementation Branch	F&E facilities and equipment
APML	Associate Program Manager for Logistics	FAA Federal Aviation Administration
APMQ	Associate Program Manager for Quality	FCA functional configuration audit
APMR	Associate Program Manager for Requirements	FTS federal telecommunications system
APMT	Associate Program Manager for Test	G/G ground-ground
ASE-200	NAS System Engineering Service, Communications Division	HVAC heating, ventilation, and air conditioning
ASE-600	NAS System Engineering Service, Configuration Management and Engineering Support Division	Hz Hertz (unit of frequency)
ASM-250	Technical Training and Certification Branch	ICSS integrated communications switching system
ASM-600	Systems Maintenance Service, National Engineering Field Support Division	ILSP integrated logistics support plan
AT	Air Traffic	ISP integrated support plan
ATC	air traffic control	JAI joint acceptance inspection
ATCT	airport traffic control tower	MSL above mean sea level
ATR-100	Air Traffic Plans and Requirements Service, System Plans and Programs Division	MTP master test plan
ATS	administrative telephone system	NAILSMT national airspace integrated logistics support management team
ATZ-100	Office of Air Traffic Program Management, Training Requirements Program	NAS National Airspace System
AXX-400	Airway Facilities division	OJT on-the-job training
		OPX off-premises extension
		ORD operational readiness demonstration
		OSTS operational support telephone system
		OT&E operational test and evaluation
		PA project authorization

PCA	physical configuration audit	TPRB	test planning review board
PIP	project implementation plan	TRACON	terminal radar approach control facility
PSTN	public switched telephone network	TSR	telecommunications service requests
PTT	push-to-talk	TVRTM	test verification requirements traceability matrix
QRO	quality and reliability officer		
SRAD	system requirements allocation document	V	Volt (unit of electric potential)
STVS	small tower voice switch	VFR	visual flight rules
T&E	test and evaluation	W	Watt (unit of power)
TO	technical officer		
TOR	technical onsite representative		

APPENDIX 2. TYPICAL STVS SITE IMPLEMENTATION SCHEDULE NETWORK

1. GENERAL. Figure 1 shows a generic (non site-specific) schedule network for the implementation of STVS at a single site. The site requirement is assumed to have been identified on January 1; based on the assumed durations and relationships of activities depicted in the figure, the total time from site requirement identification to cutover is estimated to slightly less than 11 months.

2. CRITICAL PATH. A schedule network's critical path is defined as the sequence of events or nodes that determine the minimum time in which the schedule can be fulfilled. In figure 1, the critical path is shown by a bold line. A review of the critical path nodes reveals the tasks that must be expedited to avoid delay of implementation.

a. Region/site critical-path activities.

Figure 1 reveals that the most critical activities at the

region and site levels are the early identification of new requirements, the update of site preparation estimates, engineering, and site preparation.

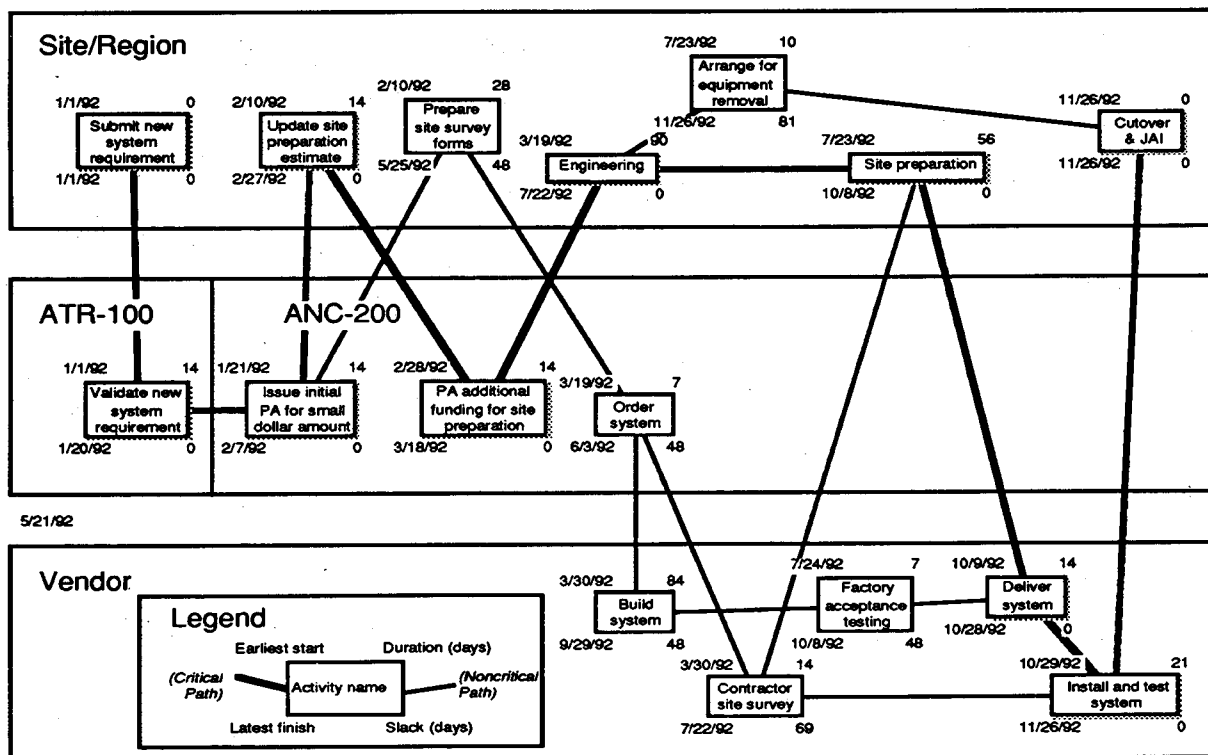
b. Headquarters critical path activities.

According to figure 1, the critical path activities for headquarters are the validation of new requirements, and the issuance and update of project authorizations (PA) to cover site engineering and preparation.

c. Vendor critical path activities.

Figure 1 shows that because of the length of time projected to be required for site engineering and preparation, most of the vendor's activities (with the exception of delivery, installation, and test) are not on the critical path. The timing of these activities is consistent with the requirement for delivery within 4 months of order as published in the STVS request for proposals.

FIGURE 1. GENERIC SITE IMPLEMENTATION SCHEDULE NETWORK



APPENDIX 3. STVS PROJECT CONTACTS

1. PROGRAM MANAGER

Joann Kansier, ANC-200
Program Manager, for Voice Switching and Recording
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Washington, DC 20024
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2 CONTRACTING OFFICER

Lisa Boeckmann
DISA-DECCO (RPFA)
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3. ASSOCIATE PROGRAM MANAGERS

a. Engineering

Stephen R. Dash, ANC-120
STVS Associate Program Manager for Engineering
475 School Street, SW
Washington, DC 20024
(202) 646-5722/FTS 967-5722

b. Logistics

George E. Clark, ANS-420
STVS Associate Program Manager for Logistics
800 Independence Avenue, SW.
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c. Quality

Curtis Perry, ASU-424A
STVS Associate Program Manager for Quality
18909 Marsh Hawk Lane
Gaithersburg, MD 20879
(301) 640-3876

d. Requirements

Leonard Parmley, ATR-110
STVS Associate Program Manager for Requirements
800 Independence Avenue, SW.
Washington, DC 20591
(202) 267-9183/FTS 267-9183

e. Test & Evaluation

Russell J. Spadea Jr., ACN-120
Manager, Voice Switching Automation Branch
FAA Technical Center
Atlantic City, NJ 08405
(609) 484-6203/FTS 482-6203

f. ATCT Integration

Wilmer Hunder, ANS-420
Manager, ATCT/TRACON Program Office
800 Independence Avenue, S.W.
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4. NATIONAL ENGINEERING FIELD SUPPORT DIVISION CONTACT

Charles Gage, ASM-600
Manager, National Engineering Field Support Division
Mike Monroney Aeronautical Center
6500 South MacArthur
Oklahoma City, OK 73125
(405) 680-3647/FTS 747-3647

5 REGIONAL AIR TRAFFIC DIVISION CONTACTS

a. Alaska Region (AAL)

Trent Cummings, AAL-510
Manager, Systems Requirements Branch
222 West 7th Avenue, Box 14
Anchorage, AK 99513
(907) 271-3066/FTS 868-3066

b. Central Region (ACE)

Donovan D. Schardt, ACE-510
Manager Systems Requirements Branch
601 East 12th Street
Kansas City, MO 64106
(816) 426-3400/FTS 867-3400

c. Eastern Region (AEA)

Charles S. Shuler, AEA-510
Manager, System Requirements Branch

JFK International Airport
Fitzgerald Federal Bldg.
Jamaica, NY 11430
(718) 917-1221/FTS 667-1221

d. Great Lakes Region (AGL)

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Manager, System Requirements Branch
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e. New England Region (ANE)

Paul Johnson, ANE-510
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(617) 273-7141/FTS 836-7141

f. Northwest Mountain Region (ANM)

Dalton Sessions, ANM-510
Manager, System Requirements Branch
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g. Southern Region (ASO)

Carlisle Cook, ASO-510
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3400 Norman Berry Drive
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(404) 763-7368

h. Southwest Region (ASW)

Philip F. Jones, III, ASW-510
Manager, System Requirements Branch
4400 Blue Mound Road Ft. Worth, TX 76193
(817) 624-5000

i. Western Pacific Region (AWP)

Lloyd Golden, AWP-510
Manager, System Requirements Branch
15000 Aviation Boulevard
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**6. REGIONAL AIRWAY FACILITIES DIVISION
CONTACTS**

a. AAL

Robert Bransky, AAL-450
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222 West 7th Avenue
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b. ACE

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c. AEA

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d. AGL

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e. ANE

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f. ANM

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g. ASO

William D. Buckhalt, ASO-430
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h. ASW

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i. AWP

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7. ATCT INTEGRATION

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ANS-240
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800 Independence Avenue, S.W.
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**406. SYSTEMS ENGINEERING AND
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Bob Stitis
STVS Project Leader
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APPENDIX 4. STVS MILESTONE SCHEDULE.**FIGURE 1. STVS MILESTONE SCHEDULE**

1. Procurement Request Approved	Jan-10-90
2. Initiate the Deployment Readiness Review (DRR) Process	May-06-91
3. Delegation of Procurement Authority Approval	Aug-14-91
4. Solicitation issued	Oct-04-91
5. Pre-proposal Conference	Oct-23-91
6. DRR Team Meeting	Sep-05-91
7. Contract Awarded	T
8. System Review	T+2
9. First Article Testing Completed	T+5
10. Functional Configuration Audit (FCA)	T+6
11. Physical Configuration Audit (PCA)	T+6
12. System Delivered to First Operational Field Site	T+6.5
13. First Site Checkouts, Integration, and Acceptance Testing Completed	T+7
14. Contractor Acceptance Inspection (CAI)	T+7
15. ACN-200 Integration Testing Completed	T+7.5
16. ASM-600 Shakedown Testing Completed	T+8
17. Deployment Decision/DRR EXCOM	T+9
18. First Operational Readiness Demonstration (ORD)	T+9
19. First Joint Acceptance Inspection (JAI)	T+9
20. System Delivered to Last Operational Site	T+42
21. Last ORD Completed	T+44

